

Two Newly Recorded Species of Genus *Ophion* (Hymenoptera: Ichneumonidae: Ophioninae) from South Korea

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ABSTRACT

One of the largest genera of subfamily Ophioninae, *Ophion*, has been reported 144 species in the World. Nevertheless, recorded members of genus *Ophion* are 40 species in the Eastern Palaearctic region, 8 in South Korea (*O. ainoicus*, *O. choaspese*, *O. flavopictus*, *O. fuscomaculatus*, *O. luteus luteus*, *O. obscuratus obscuratus*, *O. okunii*, *O. takaozanus*). In this paper, a taxonomic list of genus *Ophion* from South Korea is provided for the first time. Two newly recorded species, *Ophion hokkaidonis* Uchida and *Ophion nikkonis* Uchida, are reported from South Korea. A key to these South Korean species, diagnoses of the two newly recorded species and digital images are provided.

Keywords: key, new records, South Korea, *Ophion*, parasitic wasp

INTRODUCTION

The Ophioninae is a moderately large worldwide subfamily with about 1,100 described species (Yu et al., 2016). Rather few species are found in temperate regions, but many in the tropics. The ophionine species oviposit into exposed lepidopterous larvae of medium and larger sizes. The larvae live as internal parasites and finally destroy their hosts after the pupal chamber or cocoon is formed. Almost adult of ophionine species are nocturnal or crepuscular, though in drier areas a few are diurnally active. These have enlarged eyes and ocelli and an almost uniformly pale coloration. A few species that are day flying have smaller eyes and ocelli. Males of many species fly at dusk, but most females are not active until an hour or two after dark (Townes, 1971).

Recorded members of genus *Ophion* are 8 in South Korea, 16 in China, 21 in Russia and 10 in Japan, respectively (Yu et al., 2016).

In this study, we report *Ophion hokkaidonis* Uchida and *O. nikkonis* Uchida with diagnoses and digital images to South Korea for the first time. We also provide the key to South Korean species including two unrecorded species.

MATERIALS AND METHODS

Materials used in this study were collected by sweep net and Malaise traps, after which they were deposited in the Animal Systematic Laboratory of Yeungnam University (YNU, Gyeongsan, Korea). Distributional data mainly follow that of Yu et al. (2016). Abbreviations are used as follows: HOPE, Hope Entomological Collection, Oxford, United Kingdom; HU, Hokkaido University, Faculty of Agriculture, Entomological Institute, Sapporo, Japan; LS, Linnaean Society, London, United Kingdom; MNHN, Muséum National d'Histoire Naturelle, Paris, France; NHM, The Natural History Museum, London, United Kingdom; SIZ, Schmalhausen Institute of Zoology, Ukraine; UZM, Universitets Zoologiske Museum, Copenhagen, Denmark; ZI, Zoologiska Institutionen, Sweden; CB, Chungcheongbuk-do; GB, Gyeongsangbuk-do; GW, Gangwon-do; TD, type depository; TL, type locality; TS, type species.

Specimens were examined using an AxioCam MRc5 camera attached to a stereo microscope (Zeiss SteREO Discovery V20; Carl Zeiss, Göttingen, Germany), processed using AxioVision SE64 software (Carl Zeiss), and optimized with a Delta imaging system (i-solution; IMT i-Solution Inc. Van-

couver, Canada). The morphological terminology is mostly that of Gauld (1977) and Townes (1969, 1971).

SYSTEMATIC ACCOUNTS

¹*Order Hymenoptera

²*Family Ichneumonidae

³*Subfamily Ophioninae Shuckard, 1840

⁴*Genus *Ophion* Fabricius, 1798

Ophion Fabricius, 1798: 210, 235. TS: *Ichneumon luteus* Linnaeus.

Paniscus Schrank, 1802: 316. TS: *Ichneumon luteus* Linnaeus.

Stenophthalmus Szépligeti, 1905: 23. TS: *Stenophthalmus algericus* Szépligeti.

Pachyprotma Kohl, 1906: 223. TS: *Ophion capitatus* Kohl.
Australopion Morley, 1912: 4, 30. TS: *Ophion peregrinus* Smith.

Neopion Morley, 1912: 4, 30. TS: *Neopion crassus* Morley.
Apatophion Shestakov, 1926: 262. TS: *Apatophion mirsa* Shestakov.

Platophion Hellén, 1926: 13. TS: *Ophion areolaris* Brauns.
Potophion Cushman, 1947: 442. TS: *Potophion caudatus* Cushman.

Psylonychia Cushman, 1947: 479. TS: *Stenophthalmus algericus* Szépligeti.

Apomesus Townes, 1971: 372. TS: *Apomesus longiceps* Townes.

Mecetron Townes, 1971: 372. TS: *Stenophthalmus choaspese* Uchida.

Key to the South Korean species of Genus *Ophion* (modified from Kim et al., 2009)

1. Latero-marginal carinae of scutellum almost parallel. Scutellum square-shaped 2
 - Latero-marginal carinae of scutellum strongly convergent to the posterior. Scutellum triangle-shaped 3
2. Ocelli contiguous from eye. Interocellar area reddish yellow. Last two abdominal segments comparatively long. Ovipositor not projected beyond apical tip of abdomen *O. fuscomaculatus*
 - Ocelli widely separated from eye. Interocellar area blackish brown. Last two abdominal segments short. Ovipositor projected beyond apical tip of abdomen *O. choaspese*
3. Notauli longer than 0.5 times of the mesoscutum length and very deep. Mesoscutum with three linear blackish brown markings along notauli *O. ainoicus*

- Notauli shorter than 0.5 times of the mesoscutum. Mesoscutum color variable 4
- 4. Mesoscutum and propodeum blackish brown or black 5
 - Mesoscutum and propodeum not as above or yellow 7
- 5. Fore wing with second recurrent vein antefurcal. Antenna segment more than 55 flagellomeres 6
 - Fore wing with second recurrent vein postfurcal. Antenna segment less than 55 flagellomeres *O. hokkaidonis*
- 6. Latero-marginal carina longer than 0.5 times of the scutellum length. Mesopleural subalar prominence line indistinct. The number of distal hamuli of hind wing less than 9 *O. okunii*
 - Latero-marginal carina shorter than 0.5 times of scutellum length. Mesopleural subalar prominence line distinct. The number of distal hamuli of hind wing more than 10 *O. takaozanus*
- 7. Antenna segment more than 55 flagellomeres. Thorax with distinct yellowish markings 8
 - Antenna segment less than 55 flagellomeres. Thorax without distinct yellowish markings *O. nikkonis*
- 8. Head, thorax and propodeum with irregular whitish yellow markings. Apical segments of abdomen with medio-longitudinal whitish yellow delineated markings in each lateral sides *O. obscuratus*
 - Head, thorax, propodeum and abdomen not as above 9
- 9. Thorax without distinctly delineated yellow markings *O. luteus*
 - Thorax with distinct and irregular yellow markings *O. flavopictus*

⁵*1. *Ophion ainoicus* Uchida, 1928

Ophion ainoicus Uchida, 1928: 209. Type: ♀, TL: Japan, TD: HU.

Korean record. Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, Japan, Europe.

⁶*2. *Ophion choaspese* (Uchida, 1954)

Stenophthalmus choaspese Uchida, 1954: 68. Type: ♂, TL: Japan, TD: HU.

Korean record. Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, Japan.

⁷*3. *Ophion flavopictus* Smith, 1874

Ophion flavopictus Smith, 1874: 397. Type: ♂, TL: Japan, TD: NHM.

Korean record. Lee and Kim, 1980; Shin and Yoon, 1994;

Korean name: ¹*벌목, ²*맵시벌과, ³*왕자루맵시벌아과, ⁴*왕자루맵시벌속, ⁵*등줄왕자루맵시벌, ⁶*큰방패왕자루맵시벌, ⁷*황색왕자루맵시벌

Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, Japan.

¹* **4. *Ophion fuscomaculatus* Cameron, 1899**

Ophion fuscomaculatus Cameron, 1899: 99. Type: ♀, TL: India, TD: HOPE.

Ophion orientalis Uchida, 1928: 208. Type: ♀, TL: Russia, TD: HU.

Korean record. Uchida, 1928; Kim, 1955, 1963, 1970; Townes et al., 1965; Lee and Kim, 1980; Shin and Yoon, 1994; Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, China, Japan, Russia, India, Nepal, Pakistan, Sakhalin, Taiwan.

²* **5. *Ophion hokkaidonis* Uchida, 1928 (Fig. 1)**

Ophion hokkaidonis Uchida, 1928: 205. Type: ♀, TL: Japan, TD: HU.

Material examined. South Korea: CB: 1♀, Danyang-gun, Cheondong-ri, Mt. Sobaeksan, 8 Jun–6 Jul 2005; GB: 1♀,

Yeongju-si, Punggi-eup, Jungnyeong, 7–20 Aug 2009, Kim CJ.

Diagnosis. Female, body length 18 mm. Forewing length 15 mm. Body ground plan color deep yellow (Fig. 1G), except mesosoma black (Fig. 1B, D, E). Antenna is shorter than body. Antenna with 48 flagellar segments. Length of first and second flagellar segments about 4.87 and 1.77 times as long as the maximum width, respectively. Face weakly punctate, convex (Fig. 1A). Pronotum spiracle open. Legs slender, front tibial spur with a membranous flange present. Tarsal claws pectinated and tibial spurs normal. Fore wing with elongate pterostigma (Fig. 1F). Areolet pointed anteriorly, the second intercubitus weak. Hind wing with Cu1 1.47 times as long as cua. Abdomen laterally compressed (Fig. 1C).

Distribution. South Korea (new record), Japan, Russia.

³* **6. *Ophion luteus luteus* (Linnaeus, 1758)**

Ichneumon luteus Linnaeus, 1758: 566. Type: ♂, TD: LS.

Ophion distans Thomson, 1888: 1185. Type: ♀, TL: Sweden, TD: SIZ.

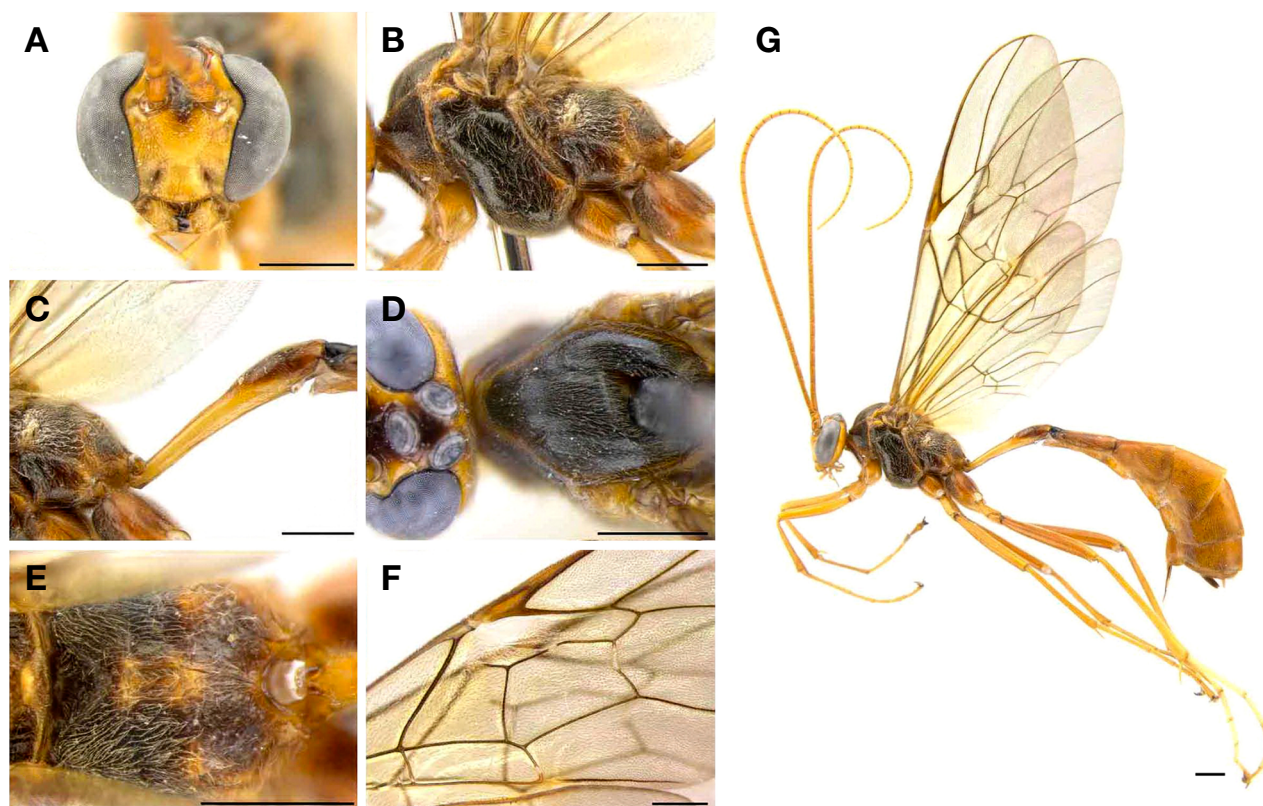


Fig. 1. *Ophion hokkaidonis*. A, Head, frontal view; B, Mesosoma, lateral view; C, Tergite 1, lateral view; D, Mesosoma, dorsal view; E, Propodeum dorsal view; F, Fore wing; G, Habitus. Scale bars: A–G = 1 mm.

Korean name: ¹*동양왕자루맵시벌, ²*홋카이도왕자루맵시벌 (신칭), ³*왕자루맵시벌

Ophion slaviceki Kriechbaumer, 1892: 232. Type: ♂, TD: ZI.

Ophion pictus Kokujev, 1906: 159. Type: ♀, TL: Ukraine, TD: lost.

Ophion calcaratus Morley, 1915: 400. Type: ♀, TL: England; TD: NHM.

Korean record. Uchida, 1928; Kim, 1955, 1963, 1970; Townes et al., 1965; Shin and Yoon, 1994; Lee and Lee, 1996; Lee and Kim, 1980; Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, China, Russia, Africa, Algeria, Australia, Austria, Belarus, Belgium, Bulgaria, Canary Islands, Cyprus, Czech, Slovakia, Estonia, Finland, France, Germany, Hungary, Iceland, India, Italy, Japan, Latvia, Lithuania, Moldova, Mongolia, Netherlands, North America, Norway, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Taiwan, Turkey, U.S.A., U.K.

¹*7. *Ophion nikkonis* Uchida, 1928 (Fig. 2)

Ophion nikkonis Uchida, 1928: 263. Type: ♀, TL: Japan, TD: HU.

Material examined. South Korea: 1 ♀, GW: Wonju-si, Heungeop-myeon, Yeonsei University, 20 Jun 2009, Han HY; Jeongseon-gun, Sindong-eup, Mt. Baegunsan, 1 ♀, 19 Jun 2011, Han HY.

Diagnosis. Female, body length 21 mm. Forewing length 16 mm. Body ground plan color deep yellow (Fig. 2C, E, G). Antenna is shorter than body. Antenna with 54 flagellar segments. Length of first and second flagellar segment about 7.33 and 1.91 times as long as the maximum width, respectively. Face weakly punctate, convex (Fig. 2A). Compound eye almost reach to ocelli (Fig. 2B). Pronotum spiracle open. Legs slender, front tibial spur with a membranous flange present. Tarsal claws pectinated and tibial spurs normal. Fore wing with elongate pterostigma (Fig. 2F). Areolet pointed anteriorly, the second intercubitus weak. Hind wing with Cu1 1.38 times as long as cua. Abdomen laterally compressed (Fig. 2D).

Distribution. South Korea (new record), Japan.

²*8. *Ophion obscuratus obscuratus* Fabricius, 1798

Ophion obscuratus Fabricius, 1798: 237, Type: ♂, TL: Germany, TD: UZM.

Ophion flavolineatus Brullé, 1846: 56. Type: ♀, TL: Pale-

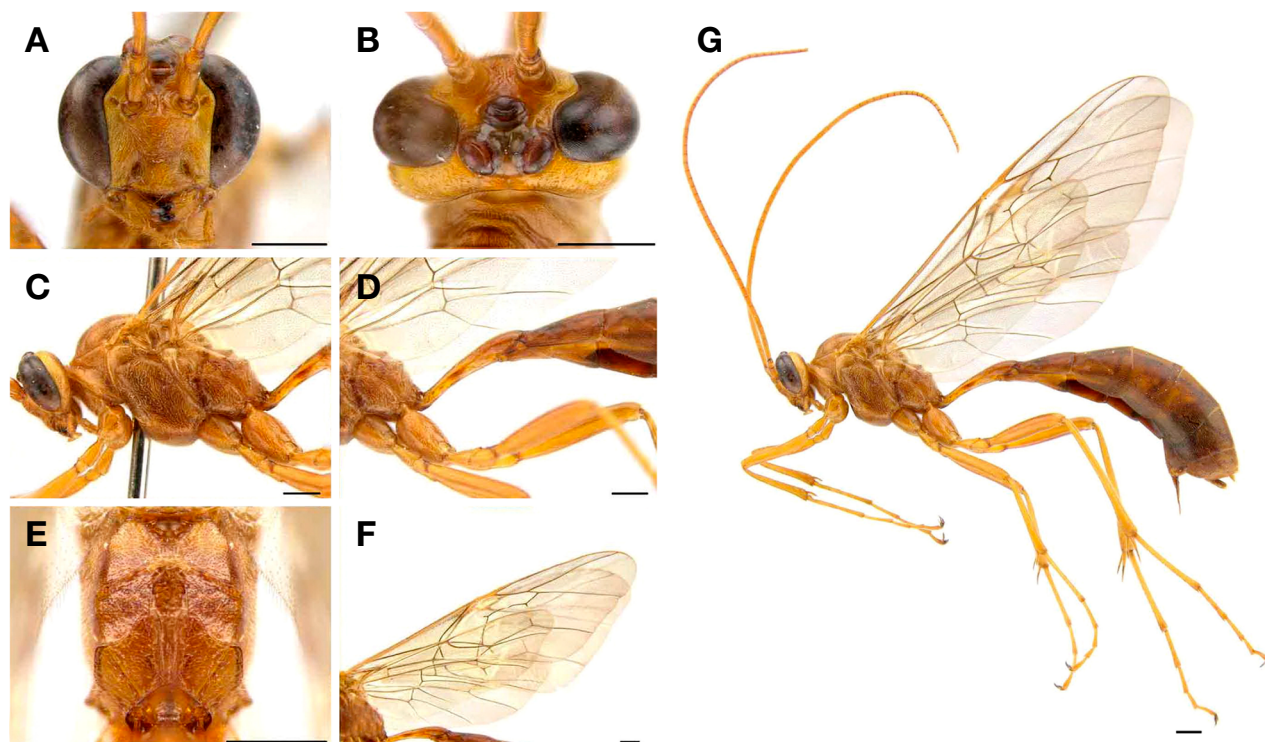


Fig. 2. *Ophion nikkonis*. A, Head, frontal view; B, Head, dorsal view; C, Mesosoma, lateral view; D, Tergite 1, lateral view; E, Propodeum dorsal view; F, Fore wing; G, Habitus. Scale bars: A-G=1 mm.

Korean name: ¹*백암왕자루맵시벌 (신칭), ²*무늬자루맵시벌

arctic, TD: MNHN.

Ophion variegatum Rudow, 1883: 240. Type: lost.

Korean record. Kim, 1955, 1963, 1970; Townes et al., 1965; Lee and Kim, 1980; Shin and Yoon, 1994; Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, China, Japan, Russia, Austria, Belgium, Bulgaria, Canary Islands, Cyprus, Czech, Slovakia, Egypt, Finland, France, Germany, Greece, Hungary, India, Israel, Latvia, Luxembourg, Moldova, Morocco, Myanmar, Nepal, Netherlands, Norway, Poland, Romania, Spain, Sweden, Taiwan, Tajikistan, Turkey, United Kingdom.

¹*9. *Ophion okunii* Uchida, 1928

Ophion okunii Uchida, 1928: 207. Type: ♀, TL: Japan, TD: HU.

Korean record. Lee and Kim, 1983; Shin and Yoon, 1994; Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, Japan.

²*10. *Ophion takaozanus* Uchida, 1928

Ophion takaozanus Uchida, 1928: 206. Type: ♂, TL: Japan, TD: HU.

Ophion sibiricus japonicus Uchida, 1928: 206. Type: ♂, TL: Japan, TD: HU.

Korean record. Lee and Kim, 1980; Shin and Yoon, 1994; Lee and Cha, 2000; Kim et al., 2009; Lee et al., 2011.

Distribution. South Korea, Japan, Russia.

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